

## REMARKS

Applicants respectfully traverse the rejections of the June 10, 2008 Office Action and request consideration. Claims 1-5, 8, 9, 11, 14-16, 19 and 21-24 are pending in the application. Claims 6-7, 12-13, 18, and 20 are allowable but objected to for depending upon rejected base claims.

### Allowable Subject Matter

Applicants thank the Examiner for noting the allowability of claims 6, 7, 12, 13, 18 and 20. See Office Action, page 19, ¶ 19 (mailed June 10, 2008), [hereinafter “OA”]. Although these claims are objected to as being dependent upon a rejected based claim, the Applicants have left these claims in their current status as the underlying based claims, that is, the independent claims have been herein amended. The Applicants therefore respectfully request reconsideration and withdrawal of the objection to the allowable claims in light of the amendments made to the base claims and in light of the discussion provided herein below.

### Summary of Office Action mailed June 10, 2008

Claims 1-5, 8-9, 11, 14-16, 19, and 21-24 are rejected under 35 U.S.C. § 103(a), as being unpatentable over Cytron et al., (*Efficiently Computing Static Single Assignment Form and the Control Dependence Graph, 1991, ACM*) (hereinafter “Cytron”). See OA, page 2, ¶ 2.

The Office Action argues based upon the alleged disclosure of Cytron in combination with the “Applicants’ admitted prior art (AAPA)”. See OA, page 2, ¶ 2. The Applicants in their background of the invention portion of their Specification discussed the Cytron reference for purposes of providing an example of a technique known as “Static Single Assignment” and dead code elimination using Static Single Assignment (SSA) form. See United States Patent Application Publication No. 2005/0166194 (published July 28, 2005), [hereinafter “Spec.”], page

1, ¶¶ 0002-0009. The Applicants specifically note that “although, this current approach [SSA form] is limited because it can only provide for the deletion of scalar instructions and fails to detect dead components.” See Spec., page 1, ¶ 0005 {emphasis added}. The Applicants therefore in the body of their Specification address the problem of superword registers and single instruction multiple data (SIMD) processing environments. See for example, Spec., page 1, ¶ 0008. The Applicants also stated in their Background of the Invention that, “if a program computes an unused value in a superword component, then the value of the component is said to be dead, whereas the other elements are termed live.” See Spec., page 1, ¶ 0009. However, “some compilers using superword registers fail to eliminate the dead code and therefore reduce operating efficiency due to extra unneeded components.” See Id.

Regarding Claim 1, the Office Action alleges that Cytron discloses various features of the Applicants’ claim related to components. See OA, page 3, ¶ 3. For example, the Office Action alleges that Cytron discloses “examining at least one second instruction, wherein the at least one second instruction is a source of the first instruction and; determining if any components within a particular field of the at least one second instruction are required.” See OA, page 3, bullet item 2, ¶ 3. The Office Action cites to page 479 of Cytron where three items are provided for determining when “a statement is marked live.” See Cytron, page 479. However as can be determined from a reading of the language of Cytron, page 479 and indeed throughout Cytron’s discussion, there is no disclosure of components as required by Applicants’ claim 1. As was discussed in detail in Applicants’ background of the invention portion of their Specification, Cytron is only related to scalar instructions. See Spec., page 1, ¶ 0005. Therefore, the three criteria described in Cytron, page 479, are used to determine when to mark a code segment “live” where the code segment is related to a scalar instruction.

The Office Action goes further to allege that “when no components of the at least one second instruction are required, deleting the at least one second instruction from the machine code,” is described also on page 479 and in Cytron, FIG. 17 related to dead code elimination. See OA, page 3, ¶ 3, bullet item 3. The Office Action refers to a sentence in Cytron stating that “our algorithm, given a Figure 17, goes one step further in eliminating dead conditional branches.” See OA, page 3, ¶ 3, bullet item 3; See also Cytron, page 479. However, Applicants respectfully submit that eliminating dead conditional branches has no relevance to components of the at least one second instruction. Likewise the Office Action on page 3 states that, “when any component of the at least one second instruction is required, adding the at least one second instruction to the WorkList in the memory,” is described in Cytron, page 480, first paragraph, third point. See OA, page 3, ¶ 3, bullet item 4 through page 4. The Office Action refers to the third point of Cytron, page 480 stating that a “*WorkList* is a set of statements whose live-ness has been recently discovered.” See OA, page 4. Again here, Applicants respectfully submit that the use of the term “statements” with respect to the discussion of Cytron is related to scalar instructions and has no relation whatsoever to “components.” Indeed, to allege that Cytron in the cited portions or, for that matter, any where else in the discussion provided by Cytron discloses components is to overlook the entire discussion provided by Applicants in their Background of the Invention. See Spec., page 1, ¶ 0002-0009.

The Applicants have provided a Background of the Invention section as required by the MPEP in § 608.01(c), ¶ 2. See MPEP, § 608.01(c), ¶ 2, page 600-80 (Revision 5, August 2006). The MPEP indicates that “where applicable, the problems involved in the prior art or other information disclosed which are solved by the Applicants’ invention should be indicated.” See Id. Also “a paragraph(s) describing to the extent practical the state of the prior art where other

information disclosed known to the Applicant, including references to specific prior art or other information where appropriate.” See Id. The Applicants have therefore provided a Background of the Invention section in their Specification to describe the known state of the art and to identify the problem that is solved by the Applicants’ claimed invention.

Therefore, the Applicants respectfully request that if the rejection is maintained regarding the features of Applicants’ claim 1 or any other of Applicants’ claims related to “components” that a specific portion of Cytron be cited such that the USPTO identifies specifically where in Cytron components are disclosed.

The Office Action admits that Cytron “does not explicitly disclose: wherein each of the first instruction includes a previous link in a write mask; and wherein each of the at least one second instruction includes a previous link and a write mask.” See OA, page 4, bullet item 1 and 2. Applicants agree because the previous link and write mask as recited in Applicants’ claim 1 are related to the components such that where, “examining at least one second instruction, wherein the at least one second instruction is a source of the first instruction and wherein each of the at least one second instruction includes a previous link in a write mask.” This is because as discussed above Cytron does not discuss components but is related to scalar instructions and applying SSA form to dead code elimination wherein the code is a set of scalar operations.

Therefore the Office Action on page 4 alleges that the so-called AAPA discloses this subject matter. See OA, page 4, bullet item 3 and 4. Applicants disagree that the SSA link described in Applicants’ Background of the Invention may be interpreted as the previous link recited in Applicants’ claims. Nonetheless, Applicants understand that the Examiner must interpret the claim language as broadly as reasonable. Therefore to avoid any such confusion

between the scalar operations related to SSA links and the operations recited in Applicants claim 1 the Applicants have amended claim 1 to include inherent language.

Therefore, claim 1 as amended now recites “determining, using said previous link of said at least one second instruction, if any components within a particular field of the at least one second instruction are required, wherein said previous link of said second instruction links said second instruction with a prior instruction that writes at least one component of said components.” Applicants believe that by adding this inherent language to independent claim 1, any possible confusion between the scalar operation of an SSA link as described in Applicants’ Background of the Invention referred to by the Office Action as the “AAPA” is eliminated.

Therefore, in light of the discussion provided above with respect to the disclosure of Cytron and the scalar instructions and operations disclosed therein, and also in light of the amendment to independent claim 1 to add the inherent language as described above, Applicants believe claim 1 is in condition for allowance. Reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of claim 1 is respectfully requested.

Regarding independent claims 8, 14 and 19, these claims have been amended similar to claim 1 to include inherent language related to the clarification of a previous link. Therefore, the Applicants respectfully reassert the discussion above with respect to claim 1 and the disclosure of Cytron. Therefore, Applicants respectfully submit that claims 8, 14 and 19 are likewise in condition for allowance as the teachings of Cytron as well as the Applicants own so-called AAPA do not describe the subject matter as being known by those of ordinary skill. Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of independent claims 8, 14 and 19.

In light of the above discussion with respect to Applicants' independent claims, reconsideration of all of Applicants dependent claims, which add additional novel and nonobvious subject matter, is respectfully requested as these claims depend from, and include all limitations of, their corresponding independent claims.

## CONCLUSION

No amendment made was related to the statutory requirements of patentability unless expressly stated herein. Also, no amendment made was for the purpose of narrowing the scope of any claim, unless Applicant(s) has/have argued herein that such amendment was made to distinguish over a particular reference or combination of references.

It is submitted that the claims clearly define the invention, are supported by the specification and drawings, and are in a condition for allowance. Applicant respectfully requests that a timely Notice of Allowance be issued in this case. Should the Examiner have any questions or concerns that may expedite prosecution of the present application, the Examiner is encouraged to telephone the undersigned

Respectfully submitted,

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